REDISCOVERY OF *PERSEA BORBONIA* VAR. *BORBONIA* (LAURACEAE), *PROSOPIS GLANDULOSA* VAR. *GLANDULOSA* (FABACEAE), AND *PINUS PALUSTRIS* (PINACEAE) IN ARKANSAS, WITH THREE NEW ANGIOSPERM SPECIES FOR ARKANSAS (U.S.A.)

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ABSTRACT

Persea borbonia (L.) Spreng. var. *borbonia*, *Prosopis glandulosa* Torr. var. *glandulosa*, and *Pinus palustris* Mill. have been rediscovered as components of the Arkansas flora. *Persea borbonia* var. *borbonia* has not been documented in Arkansas since 1881, *Prosopis glandulosa* var. *glandulosa* not since 1955, and *Pinus palustris* not since 1983. Additionally, three species of angiosperms, *Gomphrena globosa* L., *Oxalis debilis* Kunth, and *Ruellia nudiflora* (Engelm. and A. Gray) Urb., are reported as new for Arkansas. *Oxalis debilis* is morphologically similar to, and easily confused with, *Oxalis articulata* Savigny, another non-native species of *Oxalis* that has been introduced and has become well established in Arkansas. A key to identification and photographs are included for the three *Oxalis* species with pink to lavender-colored flowers that occur in the Arkansas flora.

RESUMEN

Persea borbonia (L.) Spreng. var. *borbonia*, *Prosopis glandulosa* Torr. var. *glandulosa*, y *Pinus palustris* Mill. han sido redescubiertas como componentes a la flora de Arkansas. *Persea borbonia* var. *borbonia* no ha sido documentada en Arkansas desde 1881, *Prosopis glandulosa* var. *glandulosa* desde 1955, y *Pinus palustris* desde 1983. Adicionalmente, tres especies de angiospermas, *Gomphrena globosa* L., *Oxalis debilis* Kunth, y *Ruellia nudiflora* (Engelm. and A. Gray) Urb., se citan como nuevas para Arkansas. *Oxalis debilis* es similar morfológicamente y, fácilmente confundida con, *Oxalis articulata* Savigny, otra especie alóctona de *Oxalis* que ha sido introducida y se ha establecido bien en Arkansas. Se incluyen una clave de identificación y fotografías de las tres especies de *Oxalis* con flores coloreadas de rosa a lavanda que se dan el la flora de Arkansas.

INTRODUCTION

Though vascular plant floristics in Arkansas is widely considered to have commenced with the 1819 exploratory travels of Thomas Nuttall, one of the first trained botanists to visit the area as documented by his 1835 collections publication, much additional floristic investigation has been conducted on the Arkansas flora over the past century, including the publication of over 1,200 articles by nearly 100 botanists documenting and explaining the diversity, abundance, and distribution of the state's flora and vegetation (Peck & Peck 1988; Peck et al. 2001; Peck 2003). Continued floristic work in Arkansas led to the establishment of the Arkansas Vascular Flora Committee (AVFC) in 1998, tasked with the creation of a checklist, atlas, and identification manual for the nearly 3,000 species of native and naturalized vascular plants present in the flora. The AVFC published the *Checklist of the Vascular Plants of Arkansas* in 2006, with the *Atlas of the Vascular Plants of Arkansas* set for publication in late 2013. Over the past decade, numerous species have been added to the state's flora, a number of which were non-native to the U.S. (Peck & Serviss 2006; Serviss & Peck 2008; Serviss 2009; Peck 2011a, 2011b; Peck & Serviss 2011; Serviss et al. 2012), and although recent work by the authors has focused on exotic species in urban and semi-urban environments, field work in 2012 and 2013 led to the rediscovery of two rare (in Arkansas), native, woody species of angiosperms, *Persea borbonia* var. *borbonia* and *Prosopis glandulosa* var. *glandulosa*, that have not been encountered in the Arkansas flora for well over 50 years, and one gymnosperm species, *Pinus palustris*, which has not been documented in the state for 30 years. These rediscov-

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Fig. 1. Photographs of *Oxalis debilis*, *Oxalis articulata*, and *Oxalis violacea* for comparison. **A.** *Oxalis debilis*, plant and flowers. **B.** *Oxalis articulata*, plant and flowers. **C.** *Oxalis violacea*, plant and flowers (photograph of *O. violacea* by Renn Tumlison, Henderson State University).

Fig. 2. Herbarium specimens of *Oxalis debilis*, *Oxalis articulata*, and *Oxalis violacea* for comparison. **A.** *Oxalis debilis*. **B.** *Oxalis articulata*. **C.** *Oxalis violacea*.

eries vibrantly illustrate the fact that in-depth and comprehensive floristic investigation must continue to occur in Arkansas.

REDISCOVERIES IN THE ARKANSAS FLORA

Persea borbonia (L.) Spreng. var. **borbonia** (Lauraceae), Red Bay. *Persea borbonia* var. *borbonia* is a shrub or small to medium-sized tree that is native to the southeastern U.S. from eastern Texas and Louisiana to Florida, Georgia, and North Carolina (Wofford 1997). The only previous record of *P. borbonia* var. *borbonia* in Arkansas is from Miller County (*F.L. Harvey s.n.*, 18 Aug, no year present on voucher, UARK). The specific location data of the Harvey *P. borbonia* var. *borbonia* specimen is ambiguous; however, Tucker (1974) elaborated somewhat on the location, indicating that it was collected "in the vicinity of Texarkana in swampy habitat." *Persea borbonia* var. *borbonia* has not been collected in Arkansas since 1881 (Harvey 1883; Tucker 1974; Smith 1988).

Voucher specimen: **ARKANSAS. Union Co.:** a few trees and many additional shrubs growing in thicket along shore of backwater area in mucky, sandy soil, Beryl Anthony Lower Ouachita WMA, 26 Sep 2012, *Peck 2012189* (HEND).

Prosopis glandulosa Torr. var. **glandulosa** (Fabaceae), Mesquite. *Prosopis glandulosa* var. *glandulosa* is a shrub

or small tree that is native and widespread throughout much of the southwestern U.S., southern and central Great Plains, and Mexico (McGregor 1986; Isely 1998). Tucker (1976) reported this species from Pulaski County in Arkansas based on collections by D.M. Moore in 1954 and 1955, noting that it was a "true inventive" of potentially long duration that was collected along the railroad tracks on the southern edge of Little Rock, apparently brought in with livestock. Smith (1978, 1988, 1994) excluded this species from the Arkansas flora, considering it to be only a waif, and not "part of the normal flora", but Peck (2003) reinstated *P. glandulosa* var. *glandulosa* as a component of the Arkansas flora based on the Moore vouchers (*Moore 54343*, *55517*, UARK); however, *P. glandulosa* var. *glandulosa* has not been collected in Arkansas since 1955 (Peck 2003).

Voucher specimen: **ARKANSAS. Little River Co.:** one tree with flowers and six nonflowering shrubs growing in riverine lowland woods along the Red River, next to oxbow lake with sandy soil, off of state hwy. 41, Hudson Lake area, 6 Apr 2013, *Peck 2013001* (HEND).

Pinus palustris Mill. (Pinaceae), Longleaf Pine. *Pinus palustris* is a large tree that is native to the southeastern U.S. from eastern Texas and Louisiana to Florida, the Carolinas, and Virginia (Kral 1993). Shepherd and Amason documented this species from Arkansas in Union County in 1983 (*Shepherd and Amason 187*, UARK). This specimen was cited by Smith (1988), but he considered it as a possible "long-lived waif" and not truly a component of the state's flora. The 1983 Union County specimen of *P. palustris* is the only previous record of this species from Arkansas (our record is a distinct plant from that of the Shepherd and Amason record).

Voucher specimen: **ARKANSAS. Union Co.:** single tree, possibly adventive or persisting from arboricultural practices, growing at edge of regrowth pine tree farm from former hardwoods, but now mixed loblolly pine stand, mucky, sandy soil, along timber access road, 3 mi E of Junction City, 26 Jun 2013, *Peck 2013011* (HEND).

ADDITIONS TO THE ARKANSAS FLORA

Gomphrena globosa L. (Amaranthaceae), Globe Amaranth. *Gomphrena globosa* is an annual species native to tropical Asia and is commonly cultivated for its colorful, long-lasting flowers. *Gomphrena globosa* is sporadically naturalized in several southeastern states, including Louisiana and Texas, along with several states in the northeastern U.S. from Ohio and Virginia eastward to Massachusetts and New York (USDA, NRCS 2013). *Gomphrena globosa* is a prolific, self-seeding species and should be expected in other locations in Arkansas, especially in the vicinity of areas where plants of *G. globosa* are cultivated.

Voucher specimen: **ARKANSAS. Pulaski Co.:** several clusters or colonies of plants growing in sandy soil of the Arkansas River flood plain, Little Rock, Twin Rivers County Park, 28 Jul 2007, *Peck 07–1673* (HEND).

Oxalis debilis Kunth (Oxalidaceae), Pink Woodsorrel. *Oxalis debilis* is native to tropical America, but is naturalized in several southeastern states from Texas eastward to Florida and South Carolina (Nesom 2009; USDA, NRCS 2013; Figs. 1, 2). In Arkansas, *O. debilis* is weedy, occurring and spreading rapidly in areas with high disturbance, including flower beds, shrub plantings, lawns, and roadsides. *Oxalis debilis* is easily confused with another introduced species of *Oxalis*, *O. articulata* Savigny (Windowbox Woodsorrel; Figs. 1, 2). *Oxalis articulata* is native to Brazil and Argentina, and is naturalized in Arkansas and other areas in the southern U.S. *Oxalis articulata* is documented in Arkansas from several counties, but based on its overall morphological resemblance and similarity to *O. debilis*, some specimens of *O. articulata* could be misidentified and may be, in fact, *O. debilis*. *Oxalis debilis* can readily be distinguished from both *O. articulata* and the native *O. violacea* L. (Violet Woodsorrel; Figs. 1, 2) by the following key (modified from Wunderlin 1998; Horne et al. 2013).

KEY TO *OXALIS* SPECIES IN ARKANSAS WITH PINK, LAVENDER, OR PURPLE FLOWERS

1. Sepals pubescent with appressed, short-pilose trichomes; callosities present mostly along margins of leaflets; plants arising from a thick, often elongate, irregularly nodulate-segmented rhizome _____ **O. articulata**
1. Sepals glabrous or at most sparsely pubescent; callosities usually distributed over most or the entire surface of leaflets (or only at the apical notch in *O. violacea*); plants arising from a dense cluster of bulblets or a single bulb.
   2. Leaflets 2.5–4.5 cm long _____ **O. debilis**
   2. Leaflets 0.8–1.5 cm long _____ **O. violacea**

Voucher specimens: **ARKANSAS. Clark Co.:** hundreds of plants in lawn and shrub plantings, spreading via bulblets and possibly also seed,

Arkadelphia, Henderson State University campus, 2 May 2005, *Serviss 6958* (HEND); several plants in highly disturbed area along north side of building, Arkadelphia, Clark County Library, 700 block off of Caddo Street, 18 Jun 2013, *Serviss 8016* (HEND).

Ruellia nudiflora (Engelm. and A. Gray) Urb. (Acanthaceae), Violet Wild Petunia. *Ruellia nudiflora* is native to the southwestern U.S. (Arizona and Texas) and Mexico (Bailey & Bailey 1976). It has also been documented from Louisiana and Mississippi, but it is unclear whether or not it is native or introduced in those states (USDA, NRCS 2013). *Ruellia nudiflora* is probably not native in Arkansas, but rather an introduction via seed or plant contaminants in horticultural materials (soil, mulch, or potted ornamentals). *Ruellia nudiflora* is a robust perennial that prolifically self-seeds; thus, accidental introduction via horticultural endeavors seems plausible.

Voucher specimen: **ARKANSAS. Clark Co.:** several reproductive and smaller, sterile plants growing in lawn and cracks of adjacent walkway, Arkadelphia, Henderson State University campus, 2 Jul 2012, *Serviss 7488* (HEND).

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